

CLAIMS

1. A digital still camera apparatus comprising:
 - image pick-up means;
 - an electronic shutter;
 - lens aperture means;
 - smear detection means which detects a smear in an image signal from said image pick-up means;
 - electronic shutter speed measurement and control means with respect to said electronic shutter;
 - lens aperture value measurement and control means with respect to said lens aperture means;
 - automatic exposure adjustment control means which controls said electronic shutter speed measurement and control means and said lens aperture value measurement and control means;
 - automatic gain control means which controls a gain of the image signal from said image pick-up means automatically;
 - first color information integral value measurement means which measures first color information integral values of red, green and blue respectively in a predetermined color measurement area of an effective pixel region of said image pick-up means under the condition that said automatic exposure adjustment control means is fixed, with measuring a first electronic shutter speed of said electronic shutter and a first lens aperture value of said lens aperture means by said electric shutter speed measurement and control means and said lens

aperture value measurement and control means, when the smear is detected by said smear detection means;

second color information integral measurement means which measures second color information integral values of said red, green and blue respectively in said color measurement area under the condition that said automatic exposure adjustment control means is fixed, making the electronic shutter speed of said electronic shutter increase to a predetermined amount by said electronic shutter speed measurement and control means to obtain the same exposure amount as the exposure amount of said first electronic shutter speed and said first lens aperture value, so that the lens aperture of said lens aperture means is widened to that amount by said lens aperture value measurement and control means, in the condition that a gain of said automatic gain control means is fixed; and

smear amount calculation means which calculates a smear amount by said first and second color information integral values of said red, green and blue from said first and second color information integral value measurement means.

2. A video camera apparatus including a digital still camera apparatus comprising:

image pick-up means;

an electronic shutter;

lens aperture means;

smear detection means which detects a smear in an image

signal from said image pick-up means;

electronic shutter speed measurement and control means with respect to said electronic shutter;

lens aperture value measurement and control means with respect to said lens aperture means;

automatic exposure adjustment control means which controls said electronic shutter speed measurement and control means and said lens aperture value measurement and control means;

automatic gain control means which controls a gain of the image signal from said image pick-up means automatically;

first color information integral value measurement means which measures first color information integral value of red, green and blue respectively in a predetermined color measurement area of an effective pixel region of said image pick-up means under the condition that said automatic exposure adjustment control means is fixed, with measuring a first electronic shutter speed of said electronic shutter and a first lens aperture value of said lens aperture means by said electric shutter speed measurement and control means and said lens aperture value measurement and control means, when the smear is detected by said smear detection means;

second color information integral measurement means which measures second color information integral values of said red, green and blue respectively in said color measurement area under the condition that said automatic exposure adjustment control

means is fixed, making the electronic shutter speed of said electronic shutter increase to a predetermined amount by said electronic shutter speed measurement and control means to obtain the same exposure amount as the exposure amount of said first electronic shutter speed and said first lens aperture value, so that the lens aperture of said lens aperture means is widened to that amount by said lens aperture value measurement and control means, in the condition that a gain of said automatic gain control means is fixed; and

smear amount calculation means which calculates a smear amount by said first and second color information integral values of said red, green and blue from said first and second color information integral value measurement means

3. An information terminal apparatus including a digital still camera apparatus comprising:

image pick-up means;

an electronic shutter;

lens aperture means

smear detection means which detects a smear in an image signal from said image pick-up means;

electronic shutter speed measurement and control means with respect to said electronic shutter;

lens aperture value measurement and control means with respect to said lens aperture means;

automatic exposure adjustment control means which controls

said electronic shutter speed measurement and control means and said lens aperture value measurement and control means;

automatic gain control means which controls a gain of the image signal from said image pick-up means automatically;

first color information integral value measurement means which measures first color information integral values of red, green and blue respectively in a predetermined color measurement area of an effective pixel region of said image pick-up means under the condition that said automatic exposure adjustment control means is fixed, with measuring a first electronic shutter speed of said electronic shutter and a first lens aperture value of said lens aperture means by said electric shutter speed measurement and control means and said lens aperture value measurement and control means, when the smear is detected by said smear detection means;

second color information integral measurement means which measures second color information integral values of said red, green and blue respectively in said color measurement area under the condition that said automatic exposure adjustment control means is fixed, making the electronic shutter speed of said electronic shutter increase to a predetermined amount by said electronic shutter speed measurement and control means to obtain the same exposure amount as the exposure amount of said first electronic shutter speed and said first lens aperture value, so that the lens aperture of said lens aperture means is widened to

that amount by said lens aperture value measurement and control means, in the condition that a gain of said automatic gain control means is fixed; and

smear amount calculation means which calculates a smear amount by said first and second color information integral values of said red, green and blue from said first and second color information integral value measurement means.

4. A digital still camera apparatus comprising:

image pick-up means;

an electronic shutter;

lens aperture means

smear detection means which detects a smear in an image signal from said image pick-up means;

electronic shutter speed measurement and control means with respect to said electronic shutter;

lens aperture value measurement and control means with respect to said lens aperture means;

automatic exposure adjustment control means which controls said electronic shutter speed measurement and control means and said lens aperture value measurement and control means;

automatic gain control means which controls a gain of the image signal from said image pick-up means automatically;

first color information integral value measurement means which measures first color information integral values of red, green and blue respectively in a predetermined color measurement

area of an effective pixel region of said image pick-up means under the condition that said automatic exposure adjustment control means is fixed, with measuring a first electronic shutter speed of said electronic shutter and a first lens aperture value of said lens aperture means by said electric shutter speed measurement and control means and said lens aperture value measurement and control means, when the smear is detected by said smear detection means;

second color information integral measurement means which measures second color information integral values of said red, green and blue respectively in said color measurement area under the condition that said automatic exposure adjustment control means is fixed, making the electronic shutter speed of said electronic shutter decrease to a predetermined amount by said electronic shutter speed measurement and control means to obtain the same exposure amount as the exposure amount of said first electronic shutter speed and said first lens aperture value, so that the lens aperture of said lens aperture means is narrowed to that amount by said lens aperture value measurement and control means, in the condition that a gain of said automatic gain control means is fixed; and

smear amount calculation means which calculates a smear amount by said first and second color information integral values of said red, green and blue from said first and second color information integral value measurement means.

5. A video camera apparatus including a digital still camera apparatus comprising:

image pick-up means;

an electronic shutter;

lens aperture means

smear detection means which detects a smear in an image signal from said image pick-up means;

electronic shutter speed measurement and control means with respect to said electronic shutter;

lens aperture value measurement and control means with respect to said lens aperture means;

automatic exposure adjustment control means which controls said electronic shutter speed measurement and control means and said lens aperture value measurement and control means;

automatic gain control means which controls a gain of the image signal from said image pick-up means automatically;

first color information integral value measurement means which measures first color information integral values of red, green and blue respectively in a predetermined color measurement area of an effective pixel region of said image pick-up means under the condition that said automatic exposure adjustment control means is fixed, with measuring a first electronic shutter speed of said electronic shutter and a first lens aperture value of said lens aperture means by said electric shutter speed measurement and control means and said lens

aperture value measurement and control means, when the smear is detected by said smear detection means;

second color information integral measurement means which measures second color information integral values of said red, green and blue respectively in said color measurement area under the condition that said automatic exposure adjustment control means is fixed, making the electronic shutter speed of said electronic shutter decrease to a predetermined amount by said electronic shutter speed measurement and control means to obtain the same exposure amount as the exposure amount of said first electronic shutter speed and said first lens aperture value, so that the lens aperture of said lens aperture means is narrowed to that amount by said lens aperture value measurement and control means, in the condition that a gain of said automatic gain control means is fixed; and

smear amount calculation means which calculates a smear amount by said first and second color information integral values of said red, green and blue from said first and second color information integral value measurement means.

6. An information terminal apparatus including a digital still camera apparatus comprising:

image pick-up means;

an electronic shutter;

lens aperture means

smear detection means which detects a smear in an image

signal from said image pick-up means;

electronic shutter speed measurement and control means with respect to said electronic shutter;

lens aperture value measurement and control means with respect to said lens aperture means;

automatic exposure adjustment control means which controls said electronic shutter speed measurement and control means and said lens aperture value measurement and control means;

automatic gain control means which controls a gain of the image signal from said image pick-up means automatically;

first color information integral value measurement means which measures first color information integral values of red, green and blue respectively in a predetermined color measurement area of an effective pixel region of said image pick-up means under the condition that said automatic exposure adjustment control means is fixed, with measuring a first electronic shutter speed of said electronic shutter and a first lens aperture value of said lens aperture means by said electric shutter speed measurement and control means and said lens aperture value measurement and control means, when the smear is detected by said smear detection means;

second color information integral measurement means which measures second color information integral values of said red, green and blue respectively in said color measurement area under the condition that said automatic exposure adjustment control

means is fixed, making the electronic shutter speed of said electronic shutter decrease to a predetermined amount by said electronic shutter speed measurement and control means to obtain the same exposure amount as the exposure amount of said first electronic shutter speed and said first lens aperture value, so that the lens aperture of said lens aperture means is narrowed to that amount by said lens aperture value measurement and control means, in the condition that a gain of said automatic gain control means is fixed; and

smear amount calculation means which calculates a smear amount by said first and second color information integral values of said red, green and blue from said first and second color information integral value measurement means.

7. The digital still camera apparatus according to claim 1, wherein

both of said measurement and control means adjust the exposure automatically by subtracting the smear amount calculated by said smear amount calculation means from the integral value in the automatic exposure adjustment condition, and adjust the white balance automatically by subtracting the smear amount calculated by said smear amount calculation means from the integral value of the amount of automatic white balance adjustment.

8. The video camera apparatus according to claim 2, wherein both of said measurement and control means adjust the

exposure automatically by subtracting the smear amount calculated by said smear amount calculation means from the integral value in the automatic exposure adjustment condition, and adjust the white balance automatically by subtracting the smear amount calculated by said smear amount calculation means from the integral value of the amount of automatic white balance adjustment.

9. The information terminal apparatus according to claim 3, wherein

both of said measurement and control means adjust the exposure automatically by subtracting the smear amount calculated by said smear amount calculation means from the integral value in the automatic exposure adjustment condition, and adjust the white balance automatically by subtracting the smear amount calculated by said smear amount calculation means from the integral value of the amount of automatic white balance adjustment.

10. The digital still camera apparatus according to claim 4, wherein

said electronic shutter speed measurement and control means makes the electronic shutter speed of said electronic shutter decrease to a fixed amount with the same exposure amount, until the smear amount calculated by said smear amount calculation means becomes small, said lens aperture value measurement and control means makes the lens aperture of said lens aperture

means narrow to that amount, and those operations are repeated.

11. The video camera apparatus according to claim 5, wherein

said electronic shutter speed measurement and control means makes the electronic shutter speed of said electronic shutter slow to a fixed amount with the same exposure amount, until the smear amount calculated by said smear amount calculation means becomes small, said lens aperture value measurement and control means makes the lens aperture of said lens aperture means narrow to that amount, and those operations are repeated.

12. The information terminal apparatus according to claim 6, wherein

said electronic shutter speed measurement and control means makes the electronic shutter speed of said electronic shutter slow to a fixed amount with the same exposure amount, until the smear amount calculated by said smear amount calculation means becomes small, said lens aperture value measurement and control means makes the lens aperture of said lens aperture means narrow to that amount, and those operations are repeated.

13. The digital still camera apparatus according to claim 1, wherein

both of said measurement and control means including:

multi-division color measurement means; and

smear detection area specifying means which specifies a smear detection area where the calculation of the smear amount

by said smear amount calculation means is performed in each area of the multi-division color measurement.

14. The video camera apparatus according to claim 2, wherein

both of said measurement and control means including:

multi-division color measurement means; and

smear detection area specifying means which specifies a smear detection area where the calculation of the smear amount by said smear amount calculation means is performed in each area of the multi-division color measurement.

15. The digital still camera apparatus according to claim 3, wherein

both of said measurement and control means including:

multi-division color measurement means; and

smear detection area specifying means which specifies a smear detection area where the calculation of the smear amount by said smear amount calculation means is performed in each area of the multi-division color measurement.